



with Mr. Nick Guertin, Deputy Director of Open Architecture, Navy Program Executive Office for Integrated Warfare Systems – PEO IWS 7B

Mr. Guertin's duties as the deputy director for OA center on enabling the Navy to buy and build systems as a coordinated enterprise effort. Over the past year, the Naval Open Architecture (NOA) initiative has garnered the attention of both the Chief of Naval Operations (CNO) as well as members of Congress.

Guertin's past duties included chief engineer for submarine combat control which incorporated the business and technical processes of the use of commercial-off-the-shelf (COTS) equipment in the Acoustic Rapid COTS Insertion (ARCI) program. He also served as a systems engineer for submarine sonar — including Acoustic Rapid COTS Insertion sonar system, a heavyweight torpedo depot engineer, and a naval shipyard nuclear test engineer. He is also a retired Navy Reserve officer with submarine service and various engineering duty ship repair and construction assignments leading up to command of a ship repair team.

Mr. Guertin sat down with CHIPS to discuss the NOA initiative, its past accomplishments and significant next steps for this effort, which is considered critical to the future of the Navy enterprise.

CHIPS: So, what exactly is open architecture?

Guertin: That's a good question to start with because it is actually not that easy to answer. The Naval OA team wrestled with it for a while because different organizations have different definitions of OA. However, the CNO and assistant Secretary of the Navy for Research, Development and Acquisition, ASN (RD&A), then Dr. Delores Etter, decided that for the purposes of Navy and Marine Corps acquisition, OA is the confluence of business and technical practices yielding modular, interoperable systems that adhere to open standards with published interfaces.

These practices are intended to significantly increase opportunities for innovation and competition, enable reuse of components, facilitate rapid technology insertion and reduce maintenance constraints.

CHIPS: What is the origin of the Naval open architecture (NOA)?

Guertin: In August 2004, then-ASN (RD&A) John Young, established the Navy's Open Architecture Enterprise Team (OAET) — a team made up of individuals from the surface, aviation, submarine, and C4I, space and Marine Corps communities — to collectively oversee the development and implementation of enterprise-wide OA processes, business strategies and technical solutions.

CHIPS: Why did Mr. Young believe OA is so critical to the future of the Navy?

Guertin: In his policy memo establishing the OAET, Mr. Young gave several reasons why it is critical for the Navy to embrace open architecture. He cited computing architectures in the fleet that are performance limited and expensive to upgrade as one driver. In addition, Mr. Young said that implementing OA across the Navy will increase processing capacity, provide system growth potential, reduce cycle time for future upgrades, and enable common, interoperable warfighting capabilities to be fielded at reduced cost.

CHIPS: Is this a technical problem that the Navy has to solve?

Guertin: Actually, it isn't. There are both technical and business principles that the OA program is trying to help implement across the enterprise. This is the area I have been spending most of my time recently. While we are touting technical aspects such as build-

ing modular systems, interoperability and secure information exchange, the principles of OA that are about business practices are the ones that represent the biggest cultural and strategic shifts in organizational behavior.

The challenges of incorporating new processes such as disclosing design information to the government and third parties, reusing software and software assets that the government has already paid for, addressing life cycle affordability early in the acquisition process, and encouraging competition and collaboration are new to many organizations.

CHIPS: Is it as big of a change as it sounds?

Guertin: Bigger because it is a cultural transformation as well for the systems engineering and acquisition communities both inside and outside the Navy. By implementing open architecture principles, we are asking people and organizations that have been building our national security systems the same way since the end of World War II to start doing it differently.

Rather than building huge end-to-end, stove-piped systems, the Navy now wants to purchase capabilities — we want to share data and modularize systems so programs can leverage off of each others' work to make building the best Naval systems in the world more affordable. This will be a huge enabler to make it to our goal of a 313-ship Navy.

Also, as I just alluded to, our industry partners have to be part of this cultural transformation. They must adapt their business models because we no longer want to let decade-long contracts for end-to-end systems as we have in the past. However, the pie isn't necessarily getting smaller, rather, contractors will have to win business to develop smaller pieces of more systems instead of all of one large system. In addition, contractors will have greater opportunities to pursue other procurements that are currently not open to competition.

CHIPS: How successful has the NOA program been so far?

Guertin: Over the past three years we have accomplished a lot. The OAET developed and refined the Open Architecture Assessment Tool (OAAT), which Navy program managers can use to determine how *open* their programs are based on our OA business and technical principles.

We also published the Naval OA Contract Guidebook for Program

Managers, which provides actual contract language for program managers who want to leverage best OA practices from others who have achieved some success. The Guidebook also provides guidance on acquiring the right data and intellectual property rights for a program as well as how to incentivize contractors to provide open systems.

I'd like to point out that this success is real and the Naval OA program has been recognized by outside organizations for its accomplishments. In fact, in June, my boss, Capt. Jim Shannon, PEO IWS 7.0, the Navy's major program manager for Future Combat Systems Open Architecture, accepted a laureate award on behalf of the program from the Computerworld Honors Program. The honors program recognizes 'the accomplishments of the men and women, organizations and institutions that are creating the global best practices in leading the world's ongoing IT revolution.'

Additionally, we have seen pockets of success in different programs across the Naval Enterprise.

CHIPS: What pockets of success are you talking about?

Guertin: Well, the poster child for OA has always been the Acoustic Rapid COTS (commercial-off-the-shelf) Insertion (ARCI) program. ARCI, of which I am a plankholder, is a submarine sonar program that used OA principles to rapidly field upgrades to both software and COTS hardware through a repeatable process to enable the fleet to deploy the latest technology while at the same time reducing costs. It came at a time in the mid-1990s when the United States had lost its acoustic superiority to the Russians, while funding was also being cut. ARCI enabled our submarine fleet to improve towed-array sensor performance seven-fold while saving \$4 billion over seven years.

Another success story is that of the aviation community's E2C Hawkeye program. The E2 program's ability to enhance capability had become too costly and was taking too long, and mission computing systems were obsolete by the time they were fielded. So, they implemented OA principles by transitioning to a commercial computing environment and modularizing software, which reduced acquisition cycle time from seven years to two-and-one-half years, and it reduced costs from over \$200 million to less than \$11 million.

CHIPS: What is the next big thing for the NOA program?

Guertin: Right now, we are working hard to fully develop our ability to reuse software and other assets across the naval enterprise. In August 2006, the surface Navy established the Software Hardware Asset Reuse Enterprise (SHARE) repository under the direction of PEO IWS. We believe SHARE has been successful during its first year. However, through feedback we have received on the repository, we recognize that there is still work to be done to get this pilot project to operate to everyone's benefit, including making access easier and acquiring more contributions to the repository.

CHIPS: What is a reuse repository; what does it have to do with OA?

Guertin: As I mentioned earlier, asset reuse — buying or developing software or other system components once and reusing them as many times as feasible — should be one of the major benefits of implementing OA. The idea of reusing technology that the govern-

ment has paid for is not novel; however, in the past sharing among programs and services was difficult.

First of all, there were no incentives to share. Second, it was difficult to know what technologies the government had purchased or at least had rights to because such assets were often stored at contractor facilities or by individual program offices.

The concept behind SHARE is to provide a central repository to which Navy program offices and contractors can contribute assets to which the Navy has at least government purpose rights. Additionally, program offices and organizations that have contracts with the Navy can withdraw assets from SHARE to improve them, learn from them, or build additional capabilities that can easily interface with them. This capability helps share information among contractors as well as increases competition because additional contractors are able to build capability for systems to which they previously could not gain access.

CHIPS: What do you mean by government purpose rights?

Guertin: Government purpose rights, or GPR, are very important to what we are trying to accomplish by implementing OA. In a nutshell, GPR is a type of intellectual property right the Navy can acquire in the systems it purchases from contractors. Depending on how much funding the Navy provides for the development of a system and the contractual agreement reached, the Navy can acquire anything from the unlimited right to use the product to restricted rights that may prohibit it from doing anything with the product except as specified in the contract.

GPR is somewhere in the middle of this spectrum — while the Navy may not own the product outright — it is allowed to use it for government purposes and share it with third parties. This prevents the Navy from being locked-in to having to use only one company to build or upgrade a particular system since others are allowed to see how it works and use that knowledge to increase capability.

The Naval OA program encourages Navy program managers to assess the data rights needs of their programs to determine whether obtaining GPR will have a significant impact on the life cycle affordability of the systems they are responsible for. If the intent is for the system to have a long life, it probably makes sense to acquire at least GPR, so you have options for upgrades in the future rather than being locked into using one contractor.

Also, with GPR the program can contribute those assets to the SHARE repository.

CHIPS: Is the Navy the only military service implementing OA, or do the Army and Air Force have similar programs?

Guertin: I'll go back to one of the OA principles I stated earlier: interoperability. By interoperability, I don't just mean within the Navy and Marine Corps, but across the services as well. More and more, the components of the Department of Defense must learn to and be able to work together. With this in mind, our team holds an ongoing dialogue with both the Army and Air Force. While we like to think the Navy is out in front in implementing OA, we know that the other services are working to implement OA principles as well.

And, in the true spirit of openness, we try to share as much information with the public as possible. That is why, with the help of the Defense Acquisition University, we established the Naval OA Web site at <https://acc.dau.mil/oa>.

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